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(54) ELECTRICAL DISTRIBUTION UNIT

(71) We, DORMAN SMITH BRITMAC LIMITED, a British Company, of Atherton Works, Blackpool Road, Preston, PR2 2DQ, Lancashire, do hereby declare the invention,

for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an underfloor distribution unit. Attention is drawn to our British Patents Nos. 1396920, 1402522, 1402524 and 1402526.

When designing large buildings it is often decided to incorporate all electrical trunking and conduit in the floor to avoid attaching structure to internal walls and to allow for open-plan offices and changes in the internal wall layout. To this end a system of trunking is laid on the floor before screed is applied and electrical distribution units provided at intervals therealong. Screed is then laid to form a floor, the tops of adjustable "lid raisers" of the units being adjusted to define the plane of the floor and screed being laid level with the top of the lid raisers to form a level floor. Each such unit has a flat lid and a frame known as a "segregator", surrounding the lid, and disposed within the lid raiser, which segregator is adjustable from level with, to above the level of the lid. When the floor covering is laid a portion thereof is adhered to the lid and the frame is left exposed, its top edge lying level or slightly below the top of the floor covering. Each 'lid raiser" thus has two functions. Firstly it has a frame which surrounds the lid (and any segregator provided) to enable it to be levelled independently of the box body which may lie on rough-poured concrete. Secondly it must support the lid, in its closed position, in a horizontal plane, and also will support the segregator.

Adiustment of the lid-raiser before screeding enables all the units to be adjusted to one common level regardless of the body of the box itself resting on uneven rough-poured concrete. An outlet plate or plates fixed to a mounting plate in the unit carry or carries electrical outlets, for example power sockets and/or telephone lines and/or audio signal outputs.

One drawback of previous distribution units is that the depth thereof has to be sufficient to accommodate all the components satisfactorily, this including any plugs engaging the sockets. It has, in the past, been extremely difficult to manufacture a box which can be incorporated in a floor having a two inch (50 mm) thick screed layer. As this screed thickness is popular with architects and builders it has not heretofore been possible to incorporate underfloor units in buildings having a two inch screed.

An object of the present invention is to provide an underfloor electrical distribution unit which can be incorporated in a two inch screed layer, yet which still can accommodate various components, with sufficient space for wiring, etc., and any one of a range of plugs of different sizes.

The invention provides an underfloor distribution unit comprising a body in the form of an open-topped box, a lid raiser having a base and upstanding side walls nesting within the box, and a segregator frame, also having upstanding side walls, nesting within the lid raiser, the base of the lid raiser having secured thereto outlet plates for mounting electrical fittings.

At each corner the lid raiser can *be* supported on a jacking screw engaging a threaded bush secured to a bottom panel of the box. The jacking screws can each have a lower thicker threaded portion and an upper plain thinner portion having a slotted upper end. The upper portion can project through an aperture in the base which rests on the shoulder formed at the upper end of the lower portion.

The segregator can have a rectangular vertical web and inwardly directed horizontal flanges adjacent to but spaced from the ends of two opposite sides. The flanges can carry threaded bushes mounting further jacking screws whose lower ends rest on the base of the said assembly.

The segregator can nest inside the vertical web of the lid-raiser and can sur-

round a lid in the form of a flat rectangular plate having legs in the form of U-shaped brackets, one limb of the U being attached to the lid and the other, in use, resting on the base of the lid raiser. Struts can interconnect the lid and the segregator.

The invention will be described further, by way of example, with reference to the accompanying drawings which show a preferred embodiment thereof, it being understood that the following description is illustrative and not limitative of the scope of the invention. In the drawings:—

Fig. 1 is an exploded perspective view of a preferred embodiment of unit conforming to the invention;

Fig. 2 is a perspective view of the unit of Fig. 1 assembled, some parts being cut away; and

Fig. 3 is a cross section on the line 3—3 of Fig. 2.

A preferred embodiment of underfloor electrical distribution unit 10 conforming to the invention has a body 11, in the form of an open-topped box made of sheet metal and comprising a rectangular bottom panel 12 and upstanding side panels 13, 14 and end panels 15, 16 each just less than two inches high. Adjacent each corner of the bottom panel 12 there is attached thereto an upstanding threaded bush 17. The two side panels 13, 14 have cut-outs 18 therein to allow the connection of trunking (not shown) by trunking connectors 19 of which two alternative types are illustrated.

An integral mounting plate and lid raiser 20 of the unit is rectangular and dimensioned to nest snugly within the body. The lid raiser 20 has a flat base plate 21, in which two rectangular apertures 22 are formed, each being overlaid by an outlet plate 23 mounting one or more electrical outlets (not shown). For example one outlet plate 23 can carry a power socket outlet and the other can carry a telephone outlet or may be blank. Each outlet plate 23 can have a peripheral downwardly directed rim (as at 34) which spaces the outlet plate 23 above the base plate 21 and gives more space between the base plate 21 and the bottom panel 12 for wiring the outlets. Each outlet plate 23 is attached to the base plate 21 by screws 24. Upstanding from the periphery of the base plate 21 is a vertical web 25 of the lid-raiser 20.

The base plate 21 of the lid-raiser 20 has, adjacent each corner thereof, an aperture 26 through which projects a thinner, unthreaded portion 27 of a jacking screw 28 whose lower, thicker threaded portion 29 engages one of the bushes 17. Shoulders on the jacking screws 28 between said portions 27, 29 support the lid-raiser 20. Above the base of the lid raiser 20 a groove (not shown) is cut in the thinner unthreaded portion 27 and an 'E' type circlip 31 inserted to prevent the lid-raiser 20 being pulled off the screws 28. The upper ends of the jacking screws 28 are slotted, as at 32, and also provide additional support for a lid of the box (to be later described). Centrally of each side of the lid raiser 20 is an upstanding peg 33 which serves additionally to support the lid.

A segregator 35 of the unit 10 comprises a rectangular vertical web 36 dimensioned to nest inside the vertical web 25 of the lid raiser 20. Horizonal flanges 37 extend inwardly from the longer side webs of the segregator at positions near to but spaced from the ends thereof. To each flange 37 is attached a threaded bush 38 with which is engaged a further jacking screw 39 whose lower end engages the base plate of the lid raiser. Between each pair of flanges 37 is provided a further flange 40 in which there is provided an aperture 41 through which a threaded locking stud 42 upstanding from the base plate 21 of the lid raiser 20, can pass to be engaged by a locking nut 43. A further aperture 44 allows the passage of a peg 33.

A lid 45 of the unit 10 is in the form of a rectangular plate of steel about 3.2 mm thick. On each shorter side of the lid 45 are provided a pair of legs 46 each in the form of a U-shaped metal support member, one limb 47 of the U being welded to the lid 45 and the other resting on the base plate 21 of the lid raiser 20 when the lid is closed. The lower limb 48 can have a layer of sound absorbing material (not shown) thereon to prevent the box "clanking" when trodden on, or can have a layer of underfelt adhered thereto to raise the lid slightly.

The flanges 49 of two of the legs adjacent one larger side of the lid 45 each have a triangular aperture 50 therein which is pivotally engaged by a rivet 51 carried on one end of a strut 52 whose other end is pivotally attached by a further rivet 53 to a point on the shorter end web of the segregator 35 adjacent the corresponding opposite side of the box 10. This enables the lid 45 to be raised and swung away from the box 10 for access. A gap 54 in one edge of the lid enables cables (not shown) to pass out of the unit 10.

Units 10 conforming to the invention can be used in buildings whose floors have a two inch thick screed layer, in generally conventional manner. The provision of the integral mounting plate and lid raiser makes the whole unit thin enough for use in this situation. After a floor has been laid of rough-poured concrete a matrix of units 10 conforming to the invention is laid, for example at intervals of six feet, and interconnected by trunking. Each unit 10 may

be covered with a temporary metal lid, or polystyrene infill to prevent entry of screed. Screed is then laid on the floor to a desired depth, smoothed and allowed to set.

To compensate for any unevenness in the units, which have to rest on the rough-poured concrete, the first mentioned jacking screws 28 are turned, if necessary, to place the top edge of the frame of the lid-raiser at a common level, so that a screed can then be floated between the units 10. The screed then being levelled. The jacking screws have a travel of sixteen millimetres to allow considerable unevenness to be compensated.

When a floor covering is laid it is laid to surround the boxes and the segregators are adjusted, by means of the further jacking screws 39, to lie level or slightly below the top of the floor covering. A piece of floor covering is then cut to fit and adhered to the top of each lid. If carpet and underlay are laid it may prove difficult to adhere first underlay and then carpet to the lids. In this situation it is possible to attach pieces of underlay or other packing material to the lower limbs of the legs 46 to enable a piece of carpet alone to be adhered to the lids. The floor covering is still level with the rest of the floor covering.

The invention is not limited to the precise details of the foregoing and variations can be made thereto within the scope of the following claims.

WHAT WE CLAIM IS:—

1. An underfloor distribution unit comprising a body in the form of an open-topped box, a lid raiser having a base and upstanding side walls nesting within the box, and a segregator frame, also having upstanding side walls, nesting within the lid raiser, the base of the lid raiser having secured thereto outlet plates for mounting electrical fittings.

2. A unit as claimed in claim 1, wherein the base of the lid raiser has apertures cut therein so that it resembles a frame, said outlet plates being secured to the base to cover the apertures.

3. A unit as claimed in claim 2, wherein at each corner the lid-raiser is supported on a jacking screw engaging a threaded bush secured to a bottom panel of the box.

4. A unit as claimed in claim 3, wherein each jacking screw has a lower thicker threaded portion and an upper plain thinner portion having a slotted upper end.

5. A unit as claimed in claim 4, wherein the upper portion projects through an aperture in the base which rests on the shoulder formed at the upper end of the lower portion.

6. A unit as claimed in any of claims 2 to 6, wherein the segregator comprises a rectangular vertical web and inwardly directed horizontal flanges carrying further jacking screws whose lower ends rest on the base of the lid raiser.

7. A unit as claimed in claim 6, wherein the segregator surrounds a lid in the form of a flat rectangular plate.

8. An underfloor distribution unit substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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1501875 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

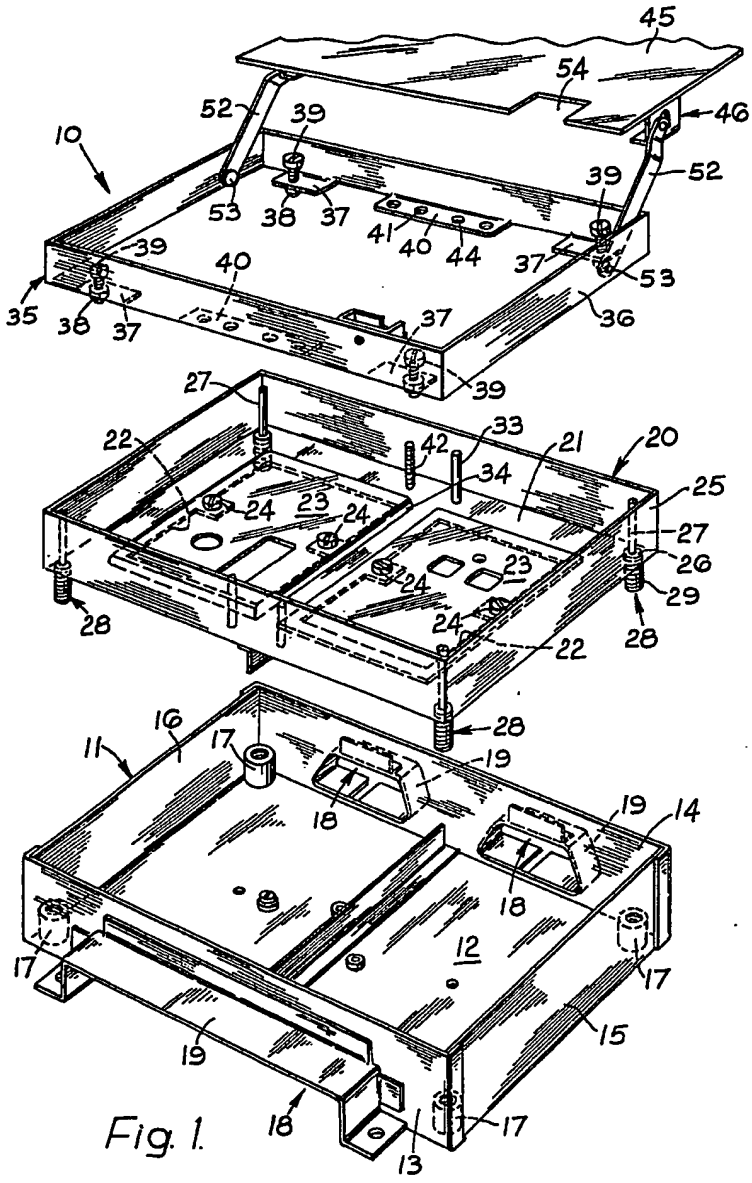

Fig. 1.

1501875 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 2

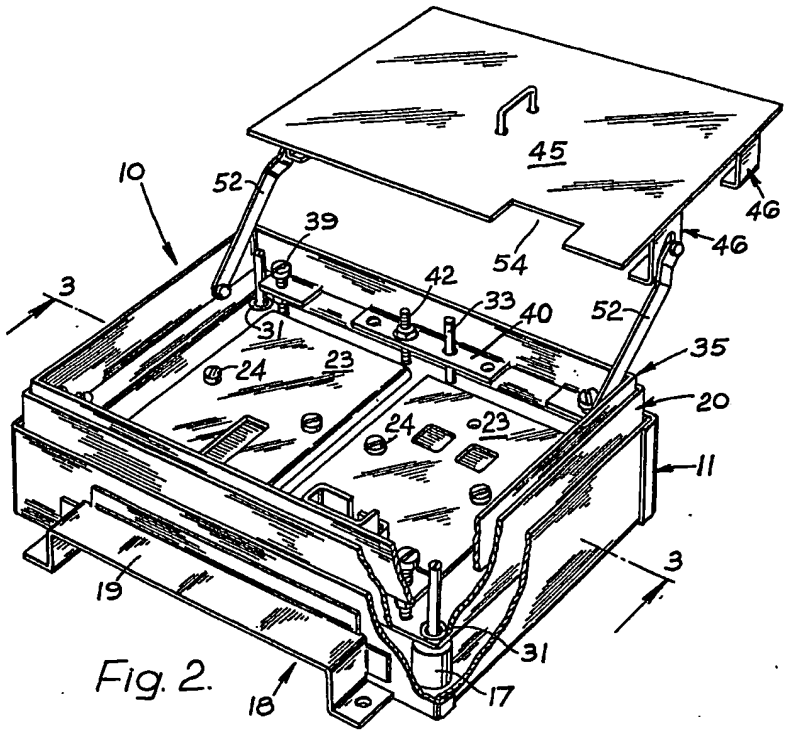

Fig. 2.

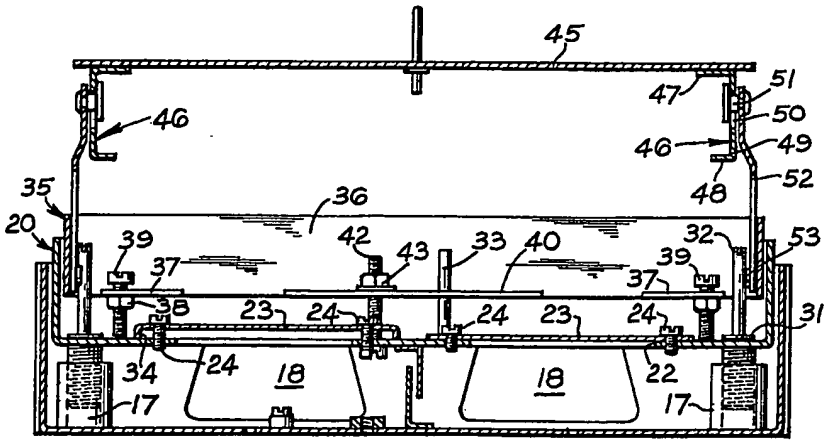

Fig. 3.